

1   **What is claimed is:**

2           1.   A method for providing to a first party already engaged in a  
3   telephone conversation with a second party via a telephone local switching  
4   office identifying information related to a calling third party wishing to  
5   converse with the first party in a manner that minimizes the time period of a  
6   mute condition for a first party, comprising the steps of:

7

8   (a)   the local switching office sending a call waiting signal to the first  
9   party;

10

11   (b)   the first party apparatus responding to the call waiting signal by  
12   transmitting to the local switching office an acknowledgment    signal  
13   indicating that it is ready to receive calling party identifying information;

14

15   (c)   concurrently with the transmission of said acknowledgement signal to  
16   said local switching office, utilizing at least one notch filter to render said  
17   acknowledgment signal substantially inaudible;

18

19   (d)   the local switching office then transmitting data corresponding to said  
20   identifying information related to the third party;

21

22   (e)   the first party apparatus responding to the detection of the presence  
23   of said data transmission by muting its' own handset;

24

25   (f)   the first party apparatus then receiving, storing, and displaying to the  
26   first party said identifying information related to the third party as received in  
27   said data transmission, thereby allowing the first party to know the identity  
28   of the third party; and

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2 (g) the first party apparatus responding to the detection of the end of  
3 said data received by terminating the muting of its' own handset, thereby  
4 allowing the first and second party to resume conversation.

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1 2. A method as in Claim 1 wherein said termination of said muting of  
2 said handset occurs before said first party apparatus displays said identifying  
3 information.  
4

5 3. A method as in Claim 1 wherein said first party apparatus initiates a  
6 timer for starting a predetermined time period that is related to at least one  
7 of the generation of said acknowledgment signal or the occurrence of the  
8 mute condition, and said termination of the muting of the handset occurs in  
9 response to expiration of said predetermined time period.  
10

11 4. A method as defined in claim 1 wherein said first party apparatus  
12 further responds by terminating said muting of said handset in response to  
13 receipt of at least one particular end of data signal present in said data  
14 transmitted from said switching office.  
15

16 5. A method as defined in claim 1 wherein said first party apparatus  
17 responds to the presence of data being transmitted from said switching  
18 office to said first party apparatus by muting its' own handset utilizing a  
19 carrier detection circuit.  
20  
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1 6. A method as defined in Claim 1 wherein said first party apparatus  
2 generates a message received signal back to the local switching office, after  
3 it has received said identifying data, so that the local switching office can  
4 know that the first party apparatus successfully received all of the data  
5 transmitted.

6  
7 7. A method as in Claim 6 wherein said local switching office can  
8 terminate the mute condition of said second party responsive to said  
9 message received signal from said first party apparatus so as to minimize the  
10 time that a second party is muted.

11  
12 8. A method as defined in Claim 1 wherein said first party apparatus  
13 further includes a timer for starting a predetermined period of time that is  
14 related to the detection of said data transmitted from said local switching  
15 office, and said termination of the muting of the handset of said first party  
16 apparatus occurs in response to expiration of said predetermined time  
17 period.

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1 9. The method as in claim 1 wherein said first party apparatus includes:

2

3 (a) a database recorded in memory with a plurality of associated data  
4 fields;

5

6 (b) a comparator for comparing said identifying information received with  
7 at least one of said plurality of associated data fields; and

8

9 (c) a display member for displaying at least one of (1) said received  
10 identifying information, and (2) information obtained from said plurality of  
11 data fields.

12

13 10. A method according to Claim 1:

14

15 (h) wherein said acknowledgement signal comprises a two-tone DTMF  
16 signal; and

17

18 (i) wherein said at least one notch filter comprises two notch filters, with  
19 each matched to the frequency of one part of said two-tone DTMF signal.

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1 11. A method according to Claim 1, wherein said at least one notch filter  
2 is coupled to said first party apparatus.

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4 12. A method according to Claim 1, wherein said at least one notch filter  
5 is coupled to an earpiece circuit of said first party apparatus.

6

7 13. A method according to Claim 1, wherein said at least one notch filter  
8 is applied to a voice band associated with said telephone conversation.

9

10 14. A method according to Claim 1, wherein said at least one notch filter  
11 is applied to an earpiece circuit and a microphone circuit associated with  
12 said first party apparatus.

13

14 15. A method according to Claim 1, wherein said acknowledgement  
15 signal is rendered substantially inaudible to said first party and said second  
16 party.

17

1 16. A method for providing to a first party already engaged in a telephone  
2 conversation with a second party via a telephone switching office identifying  
3 information related to a calling third party wishing to converse with the first  
4 party in a manner that minimizes the time period of a mute condition for a  
5 first party, comprising the steps of:

6

7 (a) the local switching office sending a call waiting signal to the first  
8 party;

9

10 (b) the first party apparatus responding to the call waiting signal by  
11 transmitting to the switching office an acknowledgment signal indicating  
12 that it is ready to receive calling party identifying information;

13

14 (c) utilizing at least one notch filter to render said acknowledgment  
15 signal substantially inaudible;

16

17 (d) the switching office then transmitting data corresponding to said  
18 identifying information related to the third party;

19

20 (e) the first party apparatus responding to the detection of the presence  
21 of said data transmission by muting its' own handset;

22

23 (f) the first party apparatus then receiving and storing said identifying  
24 information related to the third party as received in said data transmission;

25

26 (g) the first party apparatus terminating the muting of its' own handset in  
27 response to a predetermined condition, thereby allowing the first and second

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- 1 party to resume conversation; and
- 2
- 3 (h) the first party apparatus converting said stored data into audible
- 4 speech which can be heard by said first party.
- 5

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1 17. A method according to Claim 16 wherein said conversion of said  
2 stored data into audible speech occurs in response to a manual selection by  
3 the first party.

4

5 18. A method according to Claim 16 wherein said converting said stored  
6 data into audible speech is caused to occur automatically for the first party  
7 by said first party apparatus.

8

9 19. A method according to Claim 16 wherein both said first party and  
10 said second party may hear said audible speech representative of said stored  
11 identifying information.

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1 20. The method as in claim 16 wherein said first party apparatus includes:

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3 (a) a database recorded in memory with a plurality of associated data  
4 fields;

5

6 (b) a comparator for comparing said identifying information received with  
7 at least one of said plurality of associated data fields; and

8

9 (c) a sound output for announcing audible speech representative of at  
10 least one of (1) said received identifying information, and (2) information  
11 obtained from said plurality of data fields.

12

13 21. A method as in Claim 16 wherein said acknowledgment signal is  
14 transmitted only if extension apparatus associated with the first party  
15 apparatus is on-hook.

16

17 22. A method according to Claim 16:

18

19 (h) wherein said acknowledgement signal comprises a two-tone DTMF  
20 signal; and

21

22 (i) wherein said at least one notch filter comprises two notch filters, with  
23 each matched to the frequency of one part of said two-tone DTMF signal.

24

25 23. A method according to Claim 16, wherein said at least one notch  
26 filter is coupled to said first party apparatus.

27

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1 24. A method according to Claim 16, wherein said at least one notch  
2 filter is coupled to an earpiece circuit of said first party apparatus.

3

4 25. A method according to Claim 16, wherein said at least one notch  
5 filter is applied to a voice band associated with said telephone conversation.

6

7 26. A method according to Claim 16, wherein said at least one notch  
8 filter is applied to an earpiece circuit and a microphone circuit associated  
9 with said first party apparatus.

10

11 27. A method according to Claim 16, wherein said acknowledgement  
12 signal is rendered substantially inaudible to said first party and said second  
13 party.

14

15 28. The method as in claim 20 wherein said database recorded in memory  
16 with a plurality of associated data fields includes textual data that is  
17 converted to audible speech using a text to speech processor contained  
18 within said first party apparatus.

19

20 29. A method as in Claim 16 wherein said apparatus initiates a timer for  
21 starting a predetermined time period when the generation of said  
22 acknowledgment signal occurs, and then initiates a mute condition in said  
23 handset in response to expiration of said predetermined time period.

24

25 30. The method as in claim 20 wherein said database recorded in memory  
26 with a plurality of associated data fields includes pre-stored sound data.

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1 31. A telephone apparatus for receiving third party caller identification  
2 information while a first party is in communication with a second party via a  
3 local switching office, which is adapted to minimize the time a mute  
4 condition must occur, comprising:  
5

6 (a) a call waiting detector for detecting a call waiting signal in the  
7 presence of communication signals on the telephone line between a first and  
8 a second party;  
9

10 (b) control circuit responsive to the detection of said call waiting signal  
11 for generating an acknowledgment signal on the telephone line to indicate to  
12 the local switching office that said telephone apparatus is authorized and  
13 ready to receive data corresponding to said third party caller identification  
14 information;  
15

16 (c) a notch filter subsystem for rendering said acknowledgement signal  
17 substantially inaudible.  
18

19 (d) a data detector for detecting the presence of data transmitted from  
20 the local switching office, which includes said third party caller identification  
21 data, after said call waiting and acknowledgement signals have been  
22 exchanged between the local switching office and the telephone apparatus;  
23

24 (e) a mute initiator for initiating a mute condition of the handset of the  
25 telephone apparatus in response to the detection of the presence of data  
26 transmitted from the local switching office;  
27

28 (f) a display member for receiving, displaying and storing identification

1 data related to a third party;

2

3 (g) an end detector for detecting the end of said data transmitted from  
4 the local switching office;

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6 (h) a termination member for terminating said mute condition in response  
7 to the detection of the end of said data transmitted from the local switching  
8 office after said identification data has been received.

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1 32. A telephone apparatus as in Claim 31 wherein said display member  
2 operates for displaying identification data occurs only after said termination  
3 of said mute condition.

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5 33. A telephone apparatus as in Claim 31 wherein said mute initiator  
6 initiates a mute condition simultaneously and concurrently with said  
7 generation of said acknowledgment signal.

8

9 34. A telephone apparatus as in Claim 31 which further includes a timer  
10 for measuring a predetermined period of time that is related to the  
11 generation of said acknowledgment signal or initiation of said mute  
12 condition, and wherein said termination member operates for terminating  
13 said mute condition in response to the expiration of said predetermined  
14 period of time.

15

16 35. A telephone apparatus as in Claim 31 wherein said mute initiator  
17 initiates a mute condition after said generation of said acknowledgment  
18 signal.

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20 36. A telephone apparatus as in Claim 31 including a carrier detection  
21 circuit.

22

23 37. A telephone apparatus as in Claim 31 including an FSK demodulator.

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1 38. A telephone apparatus as in Claim 31 that further includes a timer for  
2 measuring a predetermined period of time that is related to the receipt of  
3 said call waiting signal or generation of said acknowledgment signal, and a  
4 member for determining when said identifying data is not received within  
5 said predetermined period of time so that said mute condition in the first  
6 party apparatus is terminated.

7

8 39. A telephone apparatus as in Claim 31 wherein said control circuit is  
9 comprised of a digital signal processor.

10

11 40. A telephone apparatus as in Claim 31 wherein said control circuit is  
12 comprised of a microprocessor.

13

14 41. A telephone apparatus as in Claim 31 further comprising a detector  
15 for determining if an extension telephone set is in an off-hook condition, and  
16 inhibiting or preventing the generation of an acknowledgment signal back to  
17 the local switching office.

18

19 42. A telephone apparatus as in Claim 31 further comprising a generator  
20 for generating an un-mute signal back to the local switching office instead of  
21 an acknowledgment signal in response to detecting an off-hook condition of  
22 an extension telephone set.

23

24 43. A telephone apparatus as in Claim 31 further comprising a generator  
25 for generating an end of message signal back to said local switching office  
26 to indicate that a message was received that can be used by the local  
27 switching office to terminate a mute condition for a second party.

28

1 44. A telephone apparatus as in Claim 31 further comprising a text to  
2 speech processor for converting said identification data received and stored  
3 into audible speech signals.

4  
5 45. A telephone apparatus as in Claim 44 further comprising a manual  
6 initiator for manually initiating said text to speech processor to convert said  
7 identification data received into audible speech signals.

8  
9 46. A telephone apparatus as in Claim 44 further comprising an automatic  
10 converter for converting said identification data received into audible speech  
11 signals before re-establishing communication between said first and second  
12 party.

13  
14 47. A telephone apparatus as in Claim 44 further comprising an automatic  
15 converter for converting said identification data received into audible speech  
16 signals after re-establishing communication between said first and second  
17 party.

18  
19 48. A telephone apparatus as in Claim 31 including:

20  
21 (a) a database recorded in memory with a plurality of associated data fields;

22  
23 (b) a comparator for comparing said identifying information received with at  
24 least one of said plurality of associated data fields; and

25  
26 (c) a display member for displaying at least one of (1) said received  
27 identifying information, and (2) information obtained from said plurality of  
28 data fields.

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1 49. A telephone apparatus according to Claim 31, wherein said at least  
2 one notch filter is coupled to said first party apparatus.

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4 50. A telephone apparatus according to Claim 31, wherein said at least  
5 one notch filter is coupled to an earpiece circuit of said first party apparatus.

6

7 51. A telephone apparatus according to Claim 31, wherein said at least  
8 one notch filter is applied to a voice band associated with said telephone  
9 conversation.

10

11 52. A telephone apparatus according to Claim 31, wherein said at least  
12 one notch filter is applied to an earpiece circuit and a microphone circuit  
13 associated with said first party apparatus.

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15 53. A telephone apparatus according to Claim 31, wherein said  
16 acknowledgement signal is rendered substantially inaudible to said first party  
17 and said second party.

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